Project 603-14-303, Replace Air Handling Units (AHU), Phase IV
Solicitation VA249-15-B-0365
VENDOR QUESTIONS/GOVERNMENT RESPONSE

QUESTIONS:

RFI: Section 23 09 23 (Page 46-48) 2.11 Sensors (Air, Water and Steam) mentions insertion vortex and insertion turbine meters for monitoring steam. I don't see a meter schedule in the drawings... are these existing meters or will new ones be needed?

RFI 2: If new insertion vortex meters and insertion turbine meters are needed... what is the application(s) data -

Flow(s):
Line Size (s):
Flow Rates (s):
Operating Pressure (s):
Operating Temperatures (s):

RFI: Will there be a need for monitoring steam or condensate? If so, what types of meters and what is the application data?

Flow(s):
Line Size (s):
Flow Rates (s):
Operating Pressure (s):
Operating Temperatures (s):

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2.11 SENSORS (AIR, WATER AND STEAM)
D. Water flow sensors:

1. Type: Insertion vortex type with retractable probe assembly and 2 inch full port gate valve.
a. Pipe size: 3 to 24 inches.
b. Retractor: ASME threaded, non-rising stem type with hand wheel.
c. Mounting connection: 2 inch 150 PSI flange.
d. Sensor assembly: Design for expected water flow and pipe size.
e. Seal: Teflon (PTFE).

2. Controller:
a. Integral to unit.
b. Locally display flow rate and total.
c. Output flow signal to BMCS: Digital pulse type.

3. Performance:
a. Turndown: 20:1
b. Response time: Adjustable from 1 to 100 seconds.
c. Power: 24 volt DC

4. Install flow meters according to manufacturer's recommendations.

Where recommended by manufacturer because of mounting conditions, provide flow rectifier.

E. Water Flow Sensors: shall be insertion turbine type with turbine element, retractor and preamplifier/transmitter mounted on a two-inch full port isolation valve; assembly easily removed or installed as a single unit under line pressure through the isolation valve without interference with process flow; calibrated scale shall allow precise positioning of the flow element to the required insertion depth within plus or minute 0.05 inch; wetted parts shall be constructed of stainless steel. Operating power shall be nominal 24 VDC. Local instantaneous flow indicator shall be LED type in NEMA 4 enclosure with 3-1/2 digit display, for wall or panel mounting.

1. Performance characteristics:

a. Ambient conditions: -40°F to 140°F, 5 to 100% humidity.
b. Operating conditions: 125 psig, 30°F to 250°F, 0.5 to 40 feet per second velocity.
c. Nominal range (turn down ratio): 10 to 1.

d. Preamplifier mounted on meter shall provide 4-20 ma divided pulse output or switch closure signal for units of volume or mass per a time base. Signal transmission distance shall be a minimum of 6,000 feet. Preamplifier for bi-directional flow measurement shall provide a directional contact closure from a relay mounted in the preamplifier.

e. Pressure Loss: Maximum 1 percent of the line pressure in line sizes above 4 inches.

f. Ambient temperature effects, less than 0.005 percent calibrated span per °F temperature change.

g. RFI effect - flow meter shall not be affected by RFI.

h. Power supply effect less than 0.02 percent of span for a variation of plus or minus 10 percent power supply.

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2.2 AIR FLOW CONTROL VALVE (SAV/RAV/EAV)

B. Supply Air, Return Air, Exhaust Air Valve:

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1. Consists of airflow control valve with vortex airflow sensor and high speed electric actuator. The Airflow Control Valve shall consist of a compression section, two airflow control surfaces, factory-mounted digital vortex airflow measuring device, factory mounted high speed electric actuator and integral access panel(and/or)

2. Where shown/scheduled consists of airflow control valve with integrated high performance closed loop feedback controller, vortex airflow sensor and high speed electric actuator. The Airflow Control

Valve shall consist of a compression section, two airflow control surfaces, factory-mounted digital vortex airflow measuring device factory-mounted high speed electric actuator, integral access panel and integrated high performance closed-loop feedback controller with native BACnet.

3. Supply air valves for surgical service (new surgery AHU service) shall be 304 stainless steel or aluminum. Other service airflow control valves may be galvanized steel or aluminum.

C. Supply Air, Return Air, Exhaust Air Valves:

1. The compression section shall divide the airstream into at least two separate airstreams. Each airstream shall be approximately equal in size and the total open area shall be approximately 50% of the duct open area. The divided sections shall cause compression therefore creating a more laminar flow for better airflow measurement and turndown. The compression section shall be of an aerodynamic shape with a static regain section to insure minimal pressure drop. The valve shall not require any duct straight runs either upstream or downstream of the airflow valve to achieve required specified performance.

2. Airflow control valves shall be a linear type and shall operate with a minimum turndown ratio of 8 to 1. Accuracy of the airflow valve shall be 5% of reading in the 8 to 1 range of the damper.

3. The airflow control valve shall respond within one second of a change in duct static pressure when provided with factory controls.

4. The airflow control valve shall be capable of being mounted in any position (360º mounting plane) in ductwork without the need for recalibration. It shall not be required to specify mounting plane when ordering valve.

5. Airflow control valves shall operate without linkages, springs, levers, or bearings, in the airstream and shall exhibit no deadband or hysteresis. Airflow control valves shall be field selectable fail-safe to either the last position, open or closed positions depending on the application.

6. All critical components of the airflow control valve shall be easily accessible from one side of the valve.

7. Airflow control valves shall be of a low pressure drop design for energy efficiency. Valves shall not require greater pressure drop than listed at “Max CFM” on project valve schedule or 0.3”, whichever is less.

8. The airflow valve shall be complete with a digital vortex type airflow sensing device providing true airflow feedback for the system. Airflow measuring devices shall be of the Vortex Shedding type, capable of continuously monitoring the airflow volume of the duct served and electronically transmitting a signal linear to the airflow volume.

9. Individual airflow sensors shall be of rugged construction, and shall not require special handling during installation. Sensors shall be mounted on support bars. Standard materials shall be manufactured of corrosion resistant plastic.

10. Individual velocity sensors shall not be affected by dust, temperature, pressure, or humidity. The sensors shall be passive in nature, with no active parts within the air stream. The output from individual sensors shall be linear with respect to airflow velocity and shall be capable of sensing airflow in one direction only. The velocity sensors shall not require calibration.

11. The airflow sensors shall be easily accessible in the valve for
Inspection without removing valve from the duct.

12. Airflow Control Valve shall have factory installed high speed electric actuator specifically adapted to the stroke of the valve which shall operate on 24VAC. Power requirement for each airflow valve actuator shall not exceed 24VA.

13. Airflow Control Valve (where required/scheduled) shall have an integral closed-loop feedback controller. Airflow measurement through the vortex airflow sensor shall send the digital signal to the controller which modulates the high speed electric actuator to maintain desired airflow setpoint. The airflow setpoint shall have the capability of being provided through analog input, digital input, and communications over BACnet MS/TP or AVC internal program memory. Analog output signal shall be provided for airflow and alarm outputs must be provided to indicate abnormal airflow conditions.

14. Airflow Control Valve integral controller shall provide an EIA-485 port supporting BACnet MS/TP as a Full Master Node state machine.

Field programming shall be accomplished through an intuitive PC based UI (User Interface) tool. Connection between the integral controller and the computer shall be provided through a USB port located on the AVC control module.

15. Power requirement for each airflow valve with integral controller shall not exceed 27VA for all single valves and 50VA for dual valves.

16. The airflow control valve shall not exceed the NC levels shown in the Table 1. NC levels are calculated based on the octave band sound attenuation factors shown in Table 2.

a. If the airflow control device cannot meet the NC levels specified a properly sized silencer or sound attenuator must be used.

b. All silencers must be of a packless design (constructed of at least 18 gauge 316L stainless steel when used for research laboratory supply/exhaust) with a maximum pressure drop at the device's maximum rated flow rate not to exceed 0.20 inches of water. Silencers for admin/clinical spaces may include fiberglass fill with tedlar lining. All admin/clinical space silencers shall be documented / guaranteed as rated for healthcare/hospital use and the schedule AHU/FAN maximum operating system pressure.

GOVERNMENT RESPONSE:

1. Airflow control valve vortex shedding sensor is integral to the valve assembly/by airflow control valve manufacturer as per specifications. A separate airflow meter is not required.
2. No steam or condensate flow meters are indicated/required for project.
3. "Flow elements" indicated on AHU coil connection details (chilled water and preheat coils) shall be provided in accordance with specifications, sequences of operation and per the scheduled AHU water coil flow rates, pressures and associated system temperatures.
4. BTU/GPM Meter indicated on M8.02 shall be provided in accordance with specifications, sequences of operation and per the scheduled preheat pump water/glycol flow rates, pressures and associated system temperatures.
5. There are no other water "flow meters" indicated/required required for the project.